

## Two new species of Depressariidae (Lepidoptera) from Portugal

MARTIN F. V. CORLEY

Pucketty Farm Cottage, Faringdon, Oxfordshire SN7 8JP, United Kingdom

email: mcorley@freeuk.com

**Summary.** Two new species of Depressariidae, *Agonopterix mendesi* sp. n. and *Depressaria cinderella* sp. n. are described from Portugal. The larva of each species is described together with information on host-plants and parasitoids.

**Zusammenfassung.** Aus Portugal werden zwei neue Depressariidae-Arten, *Agonopterix mendesi* sp. n. und *Depressaria cinderella* sp. n., beschrieben. Für jede Art wird die Raupe beschrieben, und Angaben zu ihrer Nahrungspflanze und ihren Parasitoiden werden gegeben.

**Résumé.** Deux nouvelles espèces de Depressariidae, *Agonopterix mendesi* sp. n. et *Depressaria cinderella* sp. n., sont décrites du Portugal. Pour chaque espèce la chenille est décrite, avec en complément des données sur sa plante-hôte et ses parasitoides.

**Key words.** Lepidoptera, Depressariidae, *Agonopterix*, *Depressaria*, new species, larva, host-plants, parasitoids, Portugal.

### Introduction

Many species of Depressariidae are rarely taken at light but are readily found in the larval stage and easy to rear. Moreover the main plant families involved as host-plants are few, so that it is always worth examining species of Apiaceae, Asteraceae, particularly the group of genera related to *Centaurea* L., and shrubby species of Fabaceae during spring and early summer.

Since 1989 the author has been studying Portuguese Lepidoptera and has taken a particular interest in the Depressariidae. During that time 17 species of Depressariidae have been added to the Portuguese list (Passos de Carvalho & Corley 1995; Corley *et al.* 2000; Corley unpublished data). In addition, two species have been found and reared that remained undescribed thus far. The first species was found by speculatively examining plants of *Centaurea* for larvae. The second species was initially taken at light. When it became clear that it was a new species, a successful search was made in the locality for larvae on Apiaceae. In recent years it has been quite unusual for new species of Microlepidoptera to be described with bionomic data (larva, host-plant, parasitoids) presented here.

Most of the European species of Depressariidae were treated by Hannemann (1953), who gave figures of the male genitalia. There has been no full revision since that date. The subfamily is rather less well known in southern Europe, North Africa and Asia than is the case in central and northern Europe. Lvovsky (1981) treated the species of European Russia. A full revision of the family is desirable, but unlikely to be produced in the foreseeable future. Currently the female genitalia of a number of species have never been figured and published information on infrageneric relationships in *Agonopterix* is non-existent.

Many professional taxonomists consider that new species should only be described as part of a taxonomic revision, or where additional species are discovered after a taxonomic revision has been published. The argument for this position is that random de-

scription of new species by various authors scattered through time and in various journals is likely to produce superfluous synonyms and such papers can be overlooked in subsequent revisions. This is not the place to discuss this, beyond pointing out that taxonomy is a service industry which should be run for the benefit and convenience of all biologists and others who need names for species of organism, rather than for the convenience of taxonomists. As professional taxonomists are few in number, progress is inevitably slow and recognized species can remain undescribed for many years. Throughout the time before the new species is described it may continue to be misidentified and assigned to another species, thus causing regrettable inaccuracies in the knowledge of the other species.

Against this background it could be argued that description of a couple of new species is not particularly useful. It can be justified because the bionomic data would probably be lost if the species were unnamed. Furthermore, following description of the new taxa complete with biological information, other workers are more likely to discover them in new sites.

### *Agonopterix mendesi* sp. n.

Holotype ♂, P3608 [Corley collection number] Portugal, Algarve, Praia de Castelejo, 15 m, 26.v.1996 from larva 14.iii.1996 on *Centaurea sphaerocephala* L., Corley leg., gen. prep. BMNH 30231, coll. BMNH.

3 Paratypes: 1 ♀ P3612, same locality as holotype 27.v.1996, gen. prep. Langmaid 975, coll. Langmaid; 1 ♂ 3609, same locality as holotype 27.v.1996, gen. prep. BMNH 30232, coll. BMNH; 1 ♂ P1637, Portugal, Algarve, Bordeira, Carrapateira, 30 m, 2.vi.1993 from larva 18.iv.1993 on *Centaurea sphaerocephala*, Corley leg. et coll., gen. prep. MFVC 423.

Other material examined: 1 ♀ Portugal, Estremadura, Setúbal (no date) [P. Vieilledent], gen. prep. MFVC 1546, coll. Joannis, MNHN.

Larvae found on *Centaurea sphaerocephala* L. on the Costa Dourada, Algarve (the west facing coast of southern Portugal), were found to belong to a previously undescribed *Agonopterix* species. In April 1993 four larvae were collected at Carrapateira, near Bordeira, from which one moth and three parasitoids were reared. In March 1996 three more larvae were collected at Praia de Castelejo, near Vila de Bispo which produced three moths in May.

Description of imago (Fig. 1). – Wingspan 18–20 mm. Head pale ochreous, face whitish ochreous; labial palpus pale ochreous with a few greyish fuscous scales on outer side of segment 2; antenna with scape and base of flagellum pale ochreous, remainder of flagellum greyish fuscous. Thorax ochreous to deep ochreous. Forewing ochreous with a dark fuscous spot near dorsal side of base, a sparse scattering of greyish fuscous and ochreous brown scales over much of wing, chiefly along veins, forming small spots at vein ends, costal area free of such scales; cilia pale ochreous at base, whitish ochreous at apex. Hindwings whitish, weakly tinged ochreous, sometimes with light greyish fuscous scales along veins, one to four greyish fuscous spots between vein ends near apex; cilia concolorous with wing. Legs ochreous, dark fuscous on outer side of fore and mid femur and tibia, fore tarsus mixed fuscous on outer side. Abdomen whitish ochreous.



Fig. 1. *Agonopterix mendesi* sp. n. holotype male.

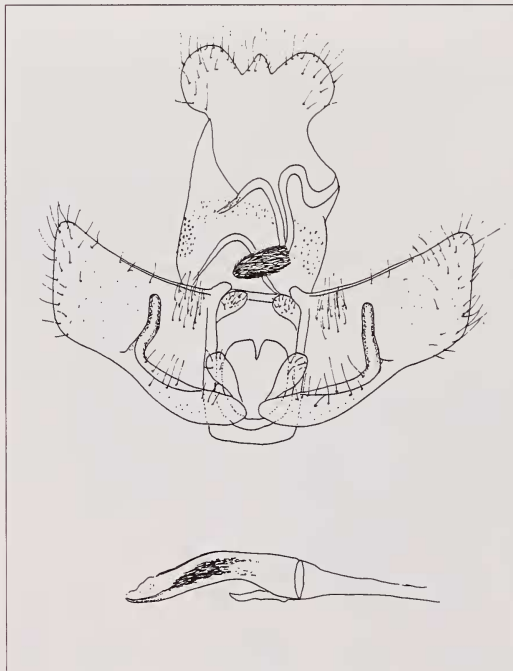


Fig. 2. *Depressaria cinderella* sp. n. holotype male.

Male genitalia (Fig. 3). – Resembling *Agonopterix squamosa* (Mann, 1864) illustrated by Hannemann (1953) but differing in the short truncated valva, straighter cuiller and more rounded anellus.

Female genitalia (Fig. 4). – Similar to those of *Agonopterix kaekeritziana* (Linnaeus, 1767) illustrated by Hannemann (1995) but with ostium close to posterior margin of sternite VIII and signum with large teeth confined to the mid-line and small marginal teeth. The ostium of *A. kaekeritziana* is near the middle of sternite VIII and the signum teeth are largest on the margin. *A. squamosa* (P. Leraut gen. prep. 917, MNHN) has the ostium close to the anterior margin of sternite VIII and the signum lobed at the margin with all the teeth small, although the marginal teeth are larger than those near the centre.

Biology. – Larvae have been found on *Centaurea sphaerocephala* in March and April, pupating before the end of April. The leaves at the shoot tip are spun together untidily, with the larva living and feeding in the upper part of the stem. Affected shoots do not flower. Solitary larval parasitoids have been reared: *Lissonota* sp. (Ichneumonidae: Banchinae) and ?-*Diadegma* sp. (Ichneumonidae: Campopleginae). In captivity the adults emerged in late May after about 35 days in the pupal stage. It is not known if the moth hibernates and lays eggs in early spring or if the eggs are laid in summer. Both strategies are known in related species. Adult moths have not been found in the field, apart from the Setúbal specimen mentioned below. Of the three sites known for this species two are coastal hills covered in blown sand, but are not strictly sand dunes; the third is a steep slope at the top of a ravine leading to the sea.



Description of larva. – Purplish-brown; head blackish-brown, prothoracic plate black; pinacula and anal plate concolorous with body.

Etymology. – The species is named after Cândido Mendes de Azevedo, the great Portuguese lepidopterist, whose works form the foundation of knowledge of the Portuguese Microlepidoptera. The specific name is a noun in the genitive case.

Additional material. – A single female labelled simply “Setúbal” was found among unnamed material in the Joannis collection (MNHN). Specimens so labelled were collected by P. Vieilledent (or one of his co-workers) in the vicinity of Setúbal, Portugal around 1900. Vieilledent sent material to J. de Joannis to be named, and some speci-

Fig. 3. *Agonopterix mendesi* sp. n. male genitalia.

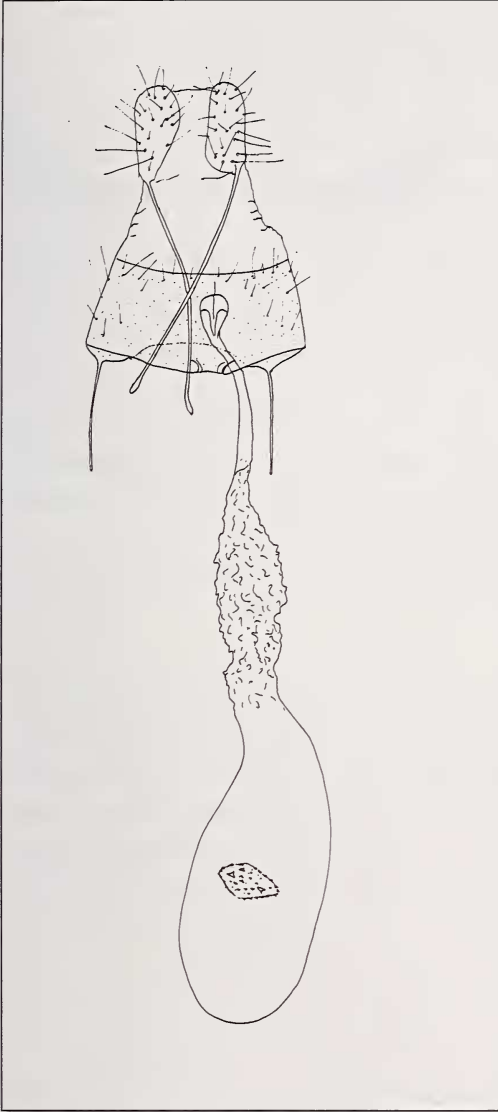


Fig. 4. *Agonopterix mendesi* sp. n. female genitalia.

mens were retained by Joannis. There is no mention of this specimen in Vieilledent (1905). The specimen is not in good condition, and the genitalia differ from those of the Algarve specimens in lacking a signum. This is presumably an aberration, and there is no reason to suppose that it belongs to another species, but in view of this difference it is not included in the type series.

**Remarks.** – Several species have similar coloration to *A. mendesi*. However *A. kaekeritziana*, *Agonopterix pallorella* (Zeller, 1839), *Agonopterix bipunctosa* (Curtis, 1850), *Agonopterix straminella* (Staudinger, 1859) and *A. squamosa* are all distinguished from *A. mendesi* by the presence of two blackish discal dots. *Agonopterix farsensis* Hannemann, 1958 from Iran has the valva somewhat truncate, with similar uncus and anellus, but more tapering cuiller. This species has a single discal dot and a dot at the base of the costa.

Several of these species have more or less green larvae, but *A. kaekeritziana* has larva coloured like those of *A. mendesi* but with the anal plate black. The larva of *A. squamosa* has not been described. Where known, the larvae of most related species live in leaves spun into tubes. *A. kaekeritziana* and *A. bipunctosa* feed initially in spun shoot tips and can feed in the apex of the stem in the same way as *A. mendesi* (Langmaid, pers. comm.)

### *Depressaria cinderella* sp. n.

Holotype ♂, P4905, Portugal, Alto Alentejo, Serra de São Mamede, Minhota, 650 m, 27.v.1998 from larva 10.iv.1998 on *Conopodium capillifolium*, Corley leg., gen. prep. BMNH 30233, coll. BMNH.

8 Paratypes: 1 ♀ P4900, same data as holotype, em. 22.v.1998, gen. prep. BMNH 30234, coll. BMNH. 1 ♀ P3842, 1 ♂ P3843, same locality as holotype, 5.vi.1996, Corley leg. et coll., gen. preps. MFVC 914 ♀, 921 ♂; 1 ♀ P4342, same locality, 14.iv.1997, Corley leg. et coll., gen. prep. MFVC 1120; 2 ♀ same locality, em. 3.vi.2000, Corley leg., P5705 in coll. Langmaid; P5709 in coll. BMNH; 1 ♀ P5712 Portugal, Alto Alentejo, Serra de São Mamede, São Mamede, 730 m, em. 3.vi.2000, Corley leg. et coll.; 1 ♀ P5714, same data em. 9.vi.2000, coll. Sauter.

Two specimens of an unusually grey *Depressaria* were taken on 5 June 1996 at light on a rocky hillside near the village of Minhota, north-east of the hilltop town of Marvão in the Serra de São Mamede, Alto Alentejo, Portugal. Although clearly belonging to the *douglasella* group, they did not appear to belong to any of the known species. The following year a single specimen was obtained at the same locality on 14 April 1997. This was an unusually early season. All three moths were in good condition, so it seemed probable that they had not hibernated.

In April 1998 the locality was revisited to search for larvae on Apiaceae. Only one species of umbellifer was found, *Conopodium capillifolium* (Guss.) Boiss. On 10 and 11 April ten larvae were found in tubular spinnings on the basal leaves of the *Conopodium* plants. After returning to England a few days later, the larvae proved difficult to rear. The basal leaves of the *Conopodium* are particularly delicate and did not remain in edible condition for as long as expected. The larvae refused the leaves of *C. majus* (Gouan) Loret, apparently because they were too thick or too tough. Eventually leaves of *Anthriscus sylvestris* (L.) Hoffm. were offered and proved acceptable. Unfortunately half the larvae died. Two moths and three parasitoids emerged in late May.

In April 2000, two larvae were collected at the original site and four at a new site, on São Mamede, Serra de São Mamede, producing two moths from each site and two parasitoids from the new site.

**Description of imago** (Fig. 2). – Wingspan 16.5–19 mm. Head whitish, with a few grey scales on vertex, face white or creamy white. Antenna blackish fuscous, indistinctly ringed lighter and darker. Labial palpus with brush of scales on segment two, whitish above and on inner side, mainly dark grey on outer side; segment three blackish, with a creamy white ring at one third and apex creamy white to ochreous. Thorax white, blackish anteriorly. Forewing greyish fuscous in dorsal half and in apical area, blackish fuscous at base and in costal half, blackish at base of dorsum and on costa to mid-wing, two indistinct blackish discal spots, and sometimes a plical spot also; blackish spots between veins at apex; white or whitish grey scales widely scattered over wing, also forming more or less extensive patches at base of costa, on costa at two-fifths extending to between discal spots and at two-thirds extending to mid-wing; smaller whitish spots between veins at apex proximal to blackish spots. Cilia greyish fuscous, darker at base, light at apex. Hindwings whitish grey, greyish fuscous on dorsum and towards apex; cilia light grey with greyish fuscous base. Legs creamy whitish on femur and on inner sides, with few dark scales, tibia and tarsus heavily mixed dark fuscous, tarsal segments creamy white to ochreous distally. Abdomen greyish fuscous above, creamy white below.

**Male genitalia** (Fig. 5). – Most similar to those of *Depressaria sordidatella* Tengström, 1848 but differing in the smoothly tapering cuiller, distinctly angled inwards as it crosses costa, never bifid at apex; clavus without hairs; anellus more rounded and more deeply incised; aedeagus slightly longer and less curved.

**Female genitalia** (Fig. 6). – Differing from those of *D. sordidatella* in the position of the ostium, close to the posterior margin of sternite VIII, the four-sided signum and the apophyses posteriores being three to four times as long as the apophyses anteriores. *D. sordidatella* has the ostium in the centre of sternite VIII, a triangular

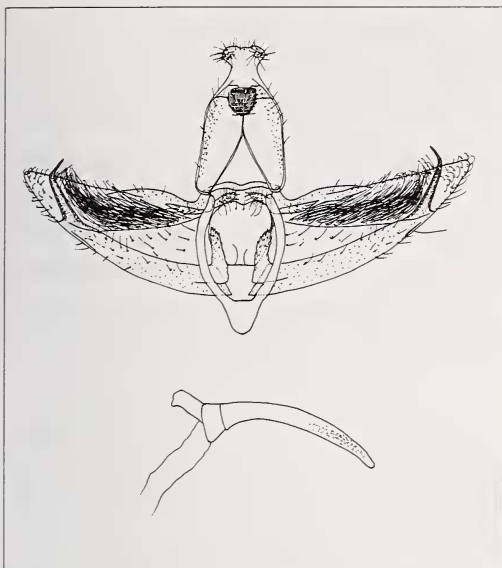


Fig. 5. *Depressaria cinderella* sp. n. male genitalia.

signum and apophyses posteriores twice as long as apophyses anteriores.

**Biology.** – Adults have been taken in April and June, but it is not known if they hibernate, laying eggs in spring, or lay eggs in summer which hatch the following spring. The latter strategy is more probable, as it is that used by other species in the *douglasella* group. Adults were not seen at the Minhota site on two nights in September, nor on one in October, but neither were they seen on one night in May, when they would have been expected to be present. Larvae have been found in April, most being full-fed by the end of the month. In early seasons, such as 1997, some larvae would be fully developed before the end of March. In captivity the pupal stage lasted about 28 days.

The host-plant *Conopodium capillifolium*

was the only umbellifer at the site. Only the basal leaves which have broad leaflets were eaten, the leaflets being spun into a tube.

The upper leaves of the plant are filiform and less delicate in texture than the basal leaves. No larvae were found on these leaves, nor on the flowers. One species of solitary larval parasitoid (*Lissonota* sp. (Ichneumonidae: Banchinae)) and one species of solitary pupal parasitoid (*Exochus* sp. (Ichneumonidae: Metopiinae)) have been reared. The habitat in the original site is a steeply sloping rocky hillside facing north-east at 640–700 m. The second site is among north facing rocks at 730 m. The host-plant grows at the foot of the acid rock slabs and in crevices.

**Description of larva.** – Dull pale green with 3 darker lines. Head and prothoracic plate yellowish green, both edged black posteriorly, sometimes markings almost absent from head. Pinacula and anal plate concolorous with body. Younger larva (before last instar) has head and prothoracic plate black.

**Etymology.** – Named from its beautiful variegated dark grey coloration and its occurrence with its two ‘ugly sisters’ *Depressaria beckmanni* Heinemann, 1870 and *Depressaria badiella* (Hübner, 1796). The specific name is a noun in apposition.

**Remarks.** – Variation occurs mainly in the darkness of the ground colour and the whiteness and extent of the pale scales on the forewing. No other species of *Depressaria* except sometimes *D. douglasella* Stainton, 1849, is completely free of brown coloration in the forewing. *D. cinderella* appears, from the male genitalia, to be closest to *D. sordidatella* (*D. weirella* Stainton, 1849). The differences in the female genitalia are more obvious.

Sauter (in Baldizzone 1996) mentions an undescribed *Depressaria* of the *douglasella* group from north-east Italy, which has the cuiller not bifurcate at apex, and surpassing

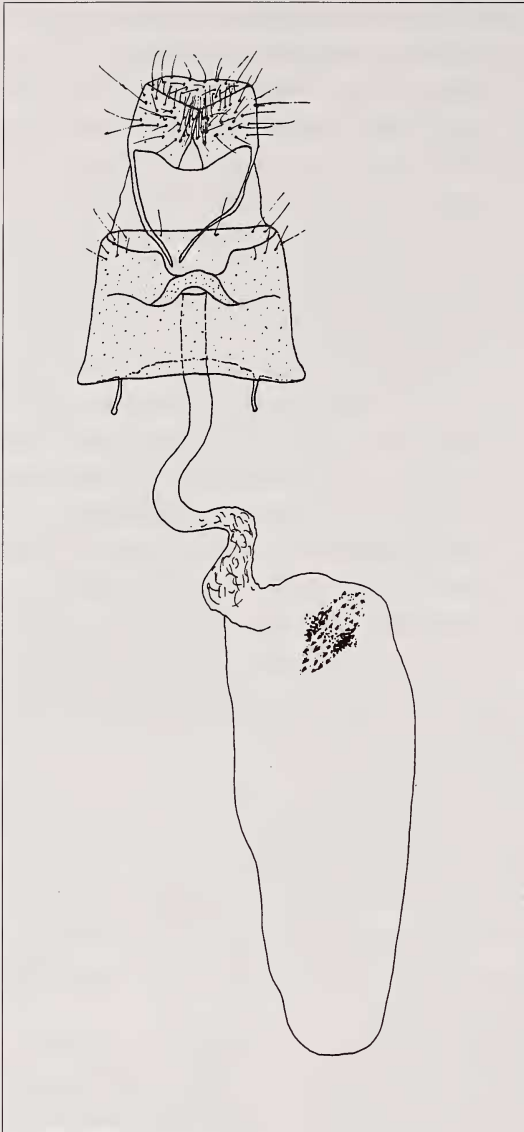


Fig. 6. *Depressaria cinderella* sp. n. female genitalia.

the costa, much more than in *sordidatella*. Professor Sauter (*in litt.*) has informed me that this is *D. incognitella* Hannemann, 1990, and that it differs from *D. cinderella* in the cuiller which is slightly angled at one third from the base, not where it crosses the costa, more slender valva and different forewing coloration (see paper of Huisman & Sauter in this issue).

The larva of *D. sordidatella* has yellowish green head and green prothoracic plate, both without markings, and black pinacula. The larvae of *D. sordidatella*, *D. douglasella* and *D. beckmanni* all spin leaflets of their host-plants into a tube in the same way as *D. cinderella*. *Depressaria pulcherrimella* Stainton, 1949, does the same when feeding on *Daucus* L. or *Pimpinella* L., but on *Conopodium majus* it spins flowers or seeds together. At the time when it is feeding flowers would not be available on the other host-plants. *D. cinderella* does not utilise the flowers although they would be available at least to the later instar larvae.

### Discussion

The distribution of many Depressariidae in Europe is wide (Lvovsky 1996), with rather few local endemic species. In the Iberian Peninsula *Depressaria genistella* Walsingham, 1903 is the only endemic

species known. *Depressaria peniculatella* Turati, 1922 was described from North Africa. *A. mendesi* might be a Portuguese endemic, as the south-west coast of Portugal does have a number of endemic taxa in various groups of organisms, but its host-plant is more widespread on the Atlantic coast of south-west Europe and North Africa and the coasts of the western Mediterranean, so that a wider distribution of the moth can be expected. *D. cinderella* will almost certainly be found in Spain since the type locality is just 5 km from the Spanish border. Because of its preference for the unusually delicate basal leaves of *C. capillifolium*, it may well be confined to the one host-plant species. *C. capillifolium* also occurs in Italy and Sicily.



The two new species bring the total of *Depressariidae* species in the Iberian Peninsula to 69, of which 61 occur in continental Spain and 34 in Portugal (data derived from Lvovsky 1996; Corley *et al.* 2000, Vives Moreno 1994, 1996; Corley unpublished data). Thus eight species are recorded from Portugal but not Spain and 35 from Spain but not Portugal. In well worked families of Lepidoptera such as the Noctuidae it is unusual for there to be any species found in Portugal but not Spain, which therefore suggests that a substantial number of species of *Depressariidae* remain to be found in Spain. The rate at which additional species have been found in Portugal in recent years indicates that more species can be expected there also. Thus the possibility of finding further species new to the Iberian Peninsula and perhaps new to science is quite high.

#### Acknowledgements

I am most grateful to the following people who have assisted in various ways: Eng. José Passos de Carvalho for the loan of specimens, and for help in many other ways; Dr Rui Santana Coreia, Director of the Parque Natural da Serra de São Mamede, for allowing me to collect in the Parque Natural and for accommodation there; Dr John Langmaid for genitalia preparations of *A. mendesi* and for the loan of genitalia slides of *A. kaekeritziana*; Clive Jermy for help with the identification of *Conopodium capillifolium*; the photographic unit of the Natural History Museum, London for the photographs of adult moths; Kevin Tuck for assistance at the Natural History Museum; Prof. Joel Minet and M. Patrice Leraut for allowing me access to the collections at MNHN; Prof. Dr Willi Sauter for reading the manuscript and comparing *D. cinderella* with *D. incognitella*; Ole Karsholt for comments on the manuscript; Dr Mark Shaw for identifying parasitoids to genus; Dr Axel Hausmann for the German summary; the trustees of the Professor Hering Memorial Research Fund for a grant enabling me to visit the Muséum National d'Histoire Naturelle, Paris.

#### References

- Baldizzone, G. 1996. I microlepidotteri del Parco Naturale del Monte Avic e zone limitrofe (Valle d'Aosta – Val Chalamy – Alpi Graie orientali). – *Rev. Valdôtaine Hist. Nat.* **50**: 55–141.
- Corley, M. F. V., A. J. Gardiner, N. Cleere & P. D. Wallis 2000. Further additions to the Lepidoptera of Algarve, Portugal (Insecta: Lepidoptera). – *SHILAP Revta. lepid.* **28**: 245–319, figs. 1–19.
- Hannemann, H.-J. 1953. Natürliche Gruppierung der europäischen Arten der Gattung *Depressaria* s.l. (Lep. Oecoph.). – *Mitt. zool. Mus. Berlin* **29**: 269–373.
- Hannemann, H.-J. 1995. Kleinschmetterlinge oder Microlepidoptera 4. Flachleibmotten (*Depressariidae*). – *Die Tierwelt Deutschlands* **69**: 1–192. – Fischer, Jena.
- Huisman, K. J. & W. Sauter 2002. Redescription of the female and distribution of *Depressaria incognitella* Hannemann, 1990 (*Depressariidae*). – *Nota lepid.* **24** (2001) (4): 37–44.
- Lvovsky, A. L. 1990. Oecophoridae. – *In: Medvedev, G.S. (ed.), Keys to the insects of the European part of the USSR. Lepidoptera*, **4** (2): viii + 1092 pp. – E. J. Brill, Leiden, New York, København, Köln.
- Lvovsky, A.L. 1996. *Depressariidae*. – *In: Karsholt, O. & J. Razowski (eds.), The Lepidoptera of Europe*. – Apollo Books, Stenstrup. 380 pp.
- Passos de Carvalho, J. & M. F. V. Corley 1995. Additions to the Lepidoptera of Algarve, Portugal (Insecta: Lepidoptera). – *SHILAP Revta. lepid.* **23**: 191–230.
- Vieilledent, P. 1905. Lepidopteros da Região de Setúbal. – *Brotéria, Lisboa* **4**: 185–206.
- Vives Moreno, A. 1994. Catálogo sistemático y sinónimo de los lepidopteros de la Península Ibérica y Baleares. (Insecta: Lepidoptera) (Segunda Parte). – Ministerio de Agricultura, Pesca y Alimentación, Madrid. – x + 775 pp.
- Vives Moreno, A. 1996. Segunda addenda et corrigenda al “Catálogo sistemático y sinónimo de los lepidopteros de la Península Ibérica y Baleares. (Insecta: Lepidoptera) (Segunda Parte)”. – *SHILAP Revta lepid.* **24**: 275–315.